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Eastern Regional Research Laboratory
Philadelphia 18, Pennsylvania

PUBLICATIONS AND PATENTS
OF THE
EASTERN REGIONAL RESEARCH LABORATORY

January -June 1950

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U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

1950

January - June

Publications

409 Ault, Waldo C., and Wells, P. A.
Animal Fat and Oil Research. Butchers' Advocate, vol. 127, no. 18, p. 9, 10, and 23, May 3, 1950.
A brief review is presented of the organization of the oil and fat work of the Laboratory and its relation to other research agencies. This is followed by a discussion of the research program and accomplishments of the Eastern Regional Research Laboratory in the field of animal fats.

410 Beinhart, Ernest G.
Farm and Factory Leaf Curing Technology of our Processing. Tobacco, vol. 130, no. 13, p. 23, 155 and 158, March 1950.
Some of the technological phases of curing and processing tobacco on the farm and in the factory are briefly described. A short historical statement is given of the origin and development of the tobacco chemists' conference, and some of the accomplishments are mentioned.

411 Brice, B. A., and Turner, A., Jr. (ERRL) and Southerland, F. L. and Bostwick, Elmer P. (Production and Marketing Administration).
Permanent Glass Color Standards for Maple Sirup. AIC-260, February 1950. (Processed). Also in The Canner, vol. 110, no. 6, p. 10 and 11. February 11, 1950; Food Industries, vol. 22, p. 82, May 1950.
The Department of Agriculture color standards for maple sirup, officially designated as "Light Amber," "Medium Amber," and "Dark Amber," have been represented heretofore by spectrophotometrically standardized carmel-glycerin solutions. Improved grading of maple sirup has been made possible by development of a simple comparator fitted with permanent glass standards. The comparator, glass color standards, and bottles used in the new grading system are briefly described.

412 Claffey, J. B., Badgett, C. O., Skalamera, J. J., and Phillips, G. W. Macpherson
Nicotine Extraction from Water with Kerosene. Industrial and Engineering Chemistry, vol. 42, p. 166-171, January 1950.
Extraction of nicotine from water by kerosene was studied. Distribution coefficients were determined for temperatures ranging from 5° to 98° C. and concentrations ranging from 1 to 794 grams of nicotine per liter of water. The effects of operating variables were determined for continuous, countercurrent, liquid-liquid extraction in a packed column. Temperature was the most important variable; nicotine extraction was increased from 28 to 92 percent by raising the extraction temperature from 22° to 84°.

413 Fein, M. L., and Fisher, C. H.

Laurates of Lactic Acid Esters. Journal of Organic Chemistry, vol. 15, p. 530-534, May 1950.

The laurates of several lactic acid esters (sec-butyl, isobutyl, 2-ethylhexyl, 2-ethoxyethyl, 2-butoxyethyl, 2-(2-ethoxyethoxy)ethyl, 2-(2-butoxyethoxy)ethyl, benzyl, cyclohexyl, and methyl isobutyl carbinyl) were prepared by acylation of the lactic ester with lauroyl chloride. The densities, refractive indices, viscosities, and boiling points at different pressures were determined. These lactate laurates are potentially useful as plasticizers.

414 Filachione, E. M., Lengel, J. H., and Ratchford, William P.

Preparation of Aryl Acrylates and Methacrylates by Pyrolysis of the Corresponding Acetoxy Esters. Journal of the American Chemical Society, vol. 72, p. 839-841, February 1950.

p-Chlorophenyl, m-tolyl, o-allylphenyl, p-tert.-butylphenyl, p-tert.-amylphenyl, and p-cyclohexylphenyl α-acetoxypropionates and phenyl α-acetoxyisobutyrate were prepared. The acetoxypropionates were pyrolyzed at 500° to 550° C. to give satisfactory yields of the corresponding acrylate. Phenyl acetoxyisobutyrate was pyrolyzed at 450° C. to give a 90 percent yield of phenyl methacrylate. Hard cast resins were obtained by polymerizing these aryl acrylates. In appearance, phenyl methacrylate polymer resembled methyl methacrylate polymer. o-Allylphenyl acrylate polymerized to an insoluble, infusible, cross-linked resin.

415 Haines, Paul G., and Eisner, Abner

Identification of Pseudo-Oxynicotine and its Conversion to N-Methyl-Myosmine. Journal of the American Chemical Society, vol. 72, p. 1719-1721, April 1950.

Pseudo-oxynicotine dihydrochloride has been identified as 3-pyridyl 3-methylaminopropyl ketone dihydrochloride, which when alkalized and distilled yields 1-methyl-2-(3-pyridyl)-2-pyrroline (N-methylmyosmine). Contrary to a previous report, the zinc-acid reduction of 3, 2'-nicotyrine did not produce N-methylmyoxmine but produced dihydronicotyrine of uncertain structure. N-methylmyosmine underwent ready polymerization on standing, but dihydronicotyrine did not. Although acid and alkali had some effect on dihydronicotyrine at elevated temperatures, there was no clear-cut evidence of isomerisms of dihydronicotyrine into N-methylmyosmine.

416 Homiller, Richard P., Phillips, G. W. Macpherson, Eskew, Roderick K., and Eisenhardt, Nelson H.

Two-Pass Concentration Technic Obtains Full-Flavor Grape Juice. Food Industries, vol. 22, p. 76-78, June 1950.

The apparatus developed by the Eastern Regional Research Laboratory for recovering the volatile flavoring constituents of apple juice can be used for the same purpose with Concord grape juice. When 20 to 25 percent of the juice is vaporized and fractionated, an essence is obtained which has characteristic grape juice aroma, but it is insufficient to restore full aroma to a concentrate made from the stripped juice. However, if the distillate obtained in concentrating the stripped juice is processed in the flavor-recovery apparatus, a second essence is obtained. The two essences blended with the concentrated stripped juice form a full-flavor concentrate. This concentrate can be reconstituted with water to make a grape juice that, for all practical purposes, has the full flavor and aroma of the original grape juice.

417 Hoover, Sam R., and Mellon, Edward F.
Application of Polarization Theory to Sorption of Water Vapor by High Polymers. Journal of the American Chemical Society, vol. 72, p. 2562-2566, June 1950.
The equation in $p_o/p_a=K_2K_1{}^a$, developed by Bradley in 1936 to describe the sorption of gases on polar sorbents through induced dipoles, has been shown to fit the experimental data for the sorption of water on a variety of high polymers. A logarithmic form of this equation has given straight-line functions for casein, benzoyl casein, silk, polyglycine, wool, ovalbumin, cotton, mercerized cotton, nylon, and viscose rayon.

418 Hougen, Leif and Hipp, N. J.
Plastic Flow Properties of Casein. Journal of Colloid Science, vol. 5, no. 3, p. 218-227, June 1950.
Plastic flow measurements of commercial and laboratory-prepared caseins have been made with the Rossi-Peakes flow tester. Flow properties of different casein samples containing different amounts of moisture were determined at temperatures from 50° to 140° C. and pressures from 500 to 3000 pounds per square inch. Only minor differences were found in the "flow temperature." A tridimensional graph for rennet casein is presented which illustrates the temperature, pressure and water content requirements necessary to obtain a given plastic flow.

419 Krewson, Charles F., and Couch, James F.
Production of Rutin from Buckwheat. Journal of the American Pharmaceutical Association, Sci. ed., vol. 39, no. 3, p. 163-169, March 1950
This paper presents the various methods used for production of rutin from buckwheat (both the green plant and the leaf meal) by solvent extraction, together with some of the accumulated data that have furnished the basis for recommendations given to rutin manufacturers. Extraction studies demonstrated the superiority of hot solvents. Of the solvents tested, hot isopropyl alcohol is preferred. The optimum strength of hot isopropyl alcohol is approximately 85 percent by volume for extraction of green buckwheat and 70-85 percent for the leaf meal. With boiling isopropyl alcohol of these solvent strengths, complete extraction of the rutin from either green buckwheat or buckwheat leaf meal is accomplished in 10 minutes.

420 Krewson, Charles F., Naghski, Joseph, and Couch, James F.
Chemical Composition of Dehydrated Buckwheat Meals and Extraction Residues. Feedstuffs, vol. 22, p. 50-51, June 24, 1950.
Buckwheat leaf meals compare favorably with alfalfa leaf meals in protein, crude fiber, fat, carotene and mineral content. Whole

meals are lower in protein than alfalfa. Stems and marcs are rich in nitrogen and potassium and could be used as soil conditioners or, on addition of supplements, for feed.

421 Morris, S. G., Myers, J. S., Jr., Kip, Mary L., and Riemenschneider, R. W.
Metal Deactivation in Lard. Journal of the American Oil Chemists Society, vol. 27, p. 105-107, March 1950.
A number of compounds, including known synergists, amino acids, and amines, were evaluated as deactivators for copper, iron, nickel and tin in lard. Some were effective as deactivators for copper but were relatively poor for iron. One compound was better for iron than for copper. Ascorbyl palmitate, potassium ascorbyl palmitate, and ascorbic, tartaric, citric and phosphoric acids were the most effective metal deactivators. This deactivation may in part explain the synergistic effect of these compounds with phenolic antioxidants. The more powerful antioxidants, however, are generally poor metal deactivators, and in the presence of traces of metallic prooxidants become relatively ineffective unless metal deactivators are also added.

422 Ogg, C. L., and Willits, C. O.
Boiling Temperatures of Kjeldahl Digestion Mixtures. Journal of the Association of Official Agricultural Chemists, vol. 33, p. 100-103, February 1950.
The minimum digestion time for a refractory nitrogenous material is a function of the boiling temperature of the Kjeldahl reaction mixture. The reaction or digestion rate is approximately doubled by a 10° increase in the boiling temperature of the mixture. Superheating the mixture also increases the reaction rate.

423 Ogg, C. L., Willits, C. O., and Ricciuti, C.
Effect of Ammonium Salts on Determination of Nicotine. Analytical Chemistry, vol. 22, p. 335-337, February 1950.
By retarding precipitation, ammonium salts interfere in determination of nicotine by the silicotungstic acid method. Graphs are presented that show the effects of concentrations of nicotine, salt and reagent, and time of digestion on recovery of nicotine. Procedures are proposed which minimize the effect of the salt.

424 Peterson, R. F., and McDowell, R. L.
Stabilization of Casein Fibers by Desamination. Textile Research Journal, vol. 20, p. 95-99, February 1950.
Casein fibers hardened with formaldehyde in aqueous solutions require additional stabilization treatment to withstand boiling acid dye baths. Acetylation in inflammable organic solvents has been used commercially. Effects of desamination are discussed, and a process combining desamination and baking after treatment with acid formaldehyde solutions is recommended as superior to acetylation.

425 Phillips, G. W. Macpherson, Aceto, Nicholas, Eskew, Roderick K., and Hurley, Rita

Production of Buckwheat Leaf Meal in Rotary Alfalfa Driers. AIC-264, March 1950. (Processed.)

Experimental pilot-plant work in which an oil-fired, farm-size, rotary alfalfa drier was used showed that rutin-bearing leaf meal can be prepared from Tartary buckwheat efficiently in such a drier, with good yield of commercial rutin. Under suitable weather conditions, sun drying the harvested plant greatly increases drier capacity and decreases the cost of fuel without loss of rutin. Equipment for commercial production is suggested, and the estimated costs of equipment and operation are given.

426 Porges, Nandor, Pepinsky, Janet B., Hendler, Nancy C., and Hoover, Sam R.

Biochemical Oxidation of Dairy Wastes. I-Methods of Study. Sewage and Industrial Wastes, vol. 22, no. 3, p. 318-325, March 1950.

Chemical procedures are presented for determining the oxygen demands of the protein, lactose and their oxidation products in dilute dairy waste and of the waste itself. Examples are given of their application to the aerobic oxidation of a simulated waste by three microorganisms.

427 Ratchford, William P.

Preparation and Properties of N-n-Alkyllactamides. Journal of Organic Chemistry, vol. 15, p. 326-332, March 1950.

Twelve N-n-Alkyllactamides were obtained in 87-99 percent yield by the aminolysis of methyl lactate, and the acetates of five of these lactamides were prepared in 90-98 percent yield by acetylation with acetic anhydride. Some of the amides and their esters are potentially useful as insect repellents, plasticizers, and surface-active agents.

428 Ratchford, William P., and Fein, M. L.

Simple Low-Power Electronic Relay. Review of Scientific Instruments, vol. 21, no. 2, p. 188, February 1950.

An inexpensive low-power relay is described. It consists of a Thyratron, a filament transformer, and two resistors.

429 Ratchford, William P., and Fein, M. L.

Improved Manostat and Manometer. Analytical Chemistry, vol. 22, p. 838-839, June 1950.

A sensitive manostat has been devised that permits rapid and precise selection of any pressure in the range 3 to 760 mm., and close control of the selected pressure. The manostat also serves as an absolute manometer in the low pressure range (up to 100 mm. of mercury) and may be calibrated for use as a manometer at higher pressures.

430 Ratchford, William P., Fisher, C. H.

Preparation of N-Substituted Lactamides by Aminolysis of Methyl Lactate. Journal of Organic Chemistry, vol. 15, p. 317-325, March 1950.

Aminolysis of methyl lactate with primary and secondary amines is shown to be a simple and convenient method for preparing many N-monosubstituted lactamides and certain types of N-disubstituted lactamides. The preparation and properties of seventeen N-substituted lactamides are described. Some are of potential interest as chemical intermediates, plasticizers, and humectants.

431 Ratchford, W. P., and Rehberg, C. E.

Acrylic Acid. Organic Syntheses, vol, 29, p. 2-6, 1949. John Wiley and Sons, New York; Chapman and Hall, London.

Acrylic acid is readily prepared on a laboratory scale by pyrolysis of ethyl acrylate. Directions are given for assembling the equipment, conducting the pyrolysis, and purifying the product. Methacrylic acid may be made similarly by the pyrolysis of ethyl methacrylate. Directions are given for an alternative procedure, the preparation of acrylic acid by the acidolysis of methyl acrylate with formic acid.

432 Rehberg, C. E.

Adjustment of Temperature Scale of Cox Charts. Industrial and Engineering Chemistry, vol. 42, p. 829-830, May 1950.

The value of C used in preparing the temperature scale of a Cox chart laid off according to the equation $y = \underline{at}/(\underline{t} + C)$ can be adjusted to any chosen value by adding the appropriate number to each temperature on the calibrated scale. Thus any one type of ruled Cox chart paper can be easily adapted to give straight lines for the temperature-vapor pressure relationship of any type of compound. This also constitutes a convenient graphical method for evaluating C in the Antoine equation, $\text{Log } P = A - B/(t + C)$.

433 Rehberg, C. E., and Dixon, Marion B.

β-Alkoxy- and Aryloxypropionates. Journal of the American Chemical Society, vol. 72, p. 2205-2206, May 1950.

Seventeen esters of β-alkoxy- and β-aryloxypropionic acids have been prepared by (a) addition of alcohols or phenols to alkyl acrylates, or (b) alcoholysis of a lower alkyl ester of the appropriate ether-acid. The order of activity in (a), above, was phenol $>$ primary alcohol $>$ secondary alcohol. Tertiary alcohols did not react.

434 Rehberg, C. E. and Dixon, Marion B.

n-Alkyl Lactates and their Acetates. Journal of the American Chemical Society, vol. 72, p. 1918-1922, May 1950.

The lactates and α-acetoxypropionates of eleven n-alkanols having 1 to 16 carbon atoms were prepared and carefully purified. Densities, refractive indices and viscosities of these esters at 20° and 40° are reported. Solubilities in water at 25° and melting points are also included. Linear equations are shown relating vapor pressures, boiling points, refractive indices, densities, viscosities and solubilities of the compounds to the number of carbon atoms in the compounds.

435 Rehberg, C. E. and Dixon, Marion B.
Mixed Esters of Lactic and Carbonic Acids. n-Alkyl Carbonates of Methyl and Butyl Lactates, and Butyl Carbonates of n-Alkyl Lactates. Journal of Organic Chemistry, vol. 15, p. 565-571, May 1950.
Three homologous series of esters, comprising 20 compounds were prepared: (a) n-alkyl carbonates of methyl lactate, (b) n-alkyl carbonates of butyl lactate and (c) butyl carbonates of n-alkyl lactates. The last two series differ only in that their alkyl groups are interchanged. Their isomeric members have almost identical physical properties. Equations were developed that relate vapor pressures, boiling points, refractive indices, densities, viscosities and solubilities to the number of carbon atoms in the members of each series.

436 Rehberg, C. E., Dixon, Marion B., and Fisher, C. H.
Diethylene Glycol Bis-carbonates of Lactic Esters. Journal of Organic Chemistry, vol. 15, p. 560-564, May 1950.
Several diethylene glycol bis-carbonates of lactic esters were made by acylation of the appropriate lactic ester with diethylene glycol bis-chloroformate ($O[CH_2CH_2OCOCl]_2$). The boiling points at different pressures, densities, refractive indices, and viscosities of the bis-carbonates were determined. Some of these high-boiling esters are potentially useful as plasticizers and resin intermediates.

437 Ricciuti, C., and Willits, C. O.
Notes on the Karl Fischer Reagent. Journal of the Association of Official Agricultural Chemists, vol. 33, p. 469-473, May 1950.
A survey was made of the literature references to the Karl Fischer reagent. By expressing the molar concentrations of the different components, a means of comparison of the reagents has been developed, and all formulas have been put on a common basis. A simplified procedure for standardizing the reagent is outlined, and an equation is presented that makes anhydrous methanol unnecessary.

438 Swern, Daniel, and Knight, H. B. (ERRL) and Shreve, O. D., and Heether, M. R. (E. I. Du Pont de Nemours and Company)
Comparison of Infrared Spectrophotometric and Lead Salt-Alcohol Methods for Determination of Trans Octadecenoic Acids and Esters. Journal of the American Oil Chemists Society, vol. 27, p. 17-21, January 1950.
The infrared spectrophotometric method, previously described by the authors, and the lead salt-alcohol method have been applied to a variety of synthetic mixtures of known composition and to other materials. Comparison of the data indicates that the infrared method is more rapid, specific and accurate than the lead salt-alcohol method. The infrared method is directly applicable to determination of trans isomers in acid or ester mixtures; it requires only small samples and they can be recovered if necessary. This method is suggested as a necessary tool to investigators conducting research on the oxidation, isomerization, polymerization, composition and hydrogenation of fats and their components and derivatives, and on the preparation of pure unsaturated acids and esters.

439 Talley, E. A., Schwartz, J. H., Hunter, A. S., and Brown, C. A.
Benzyl Allyl Starch and Other Mixed Allyl Starch Ethers. AIC-261, February 1950. (Processed.)
Preparation of several mixed ethers of starch, particularly benzyl allyl starch, was studied to develop efficient methods. The mixed ethers were examined to determine their suitability for protective coatings. Films made from benzyl allyl starch were more durable than those made from allyl starch.

440 Walton, George P.
Report on Honey. Journal of the Association of Official Agricultural Chemists, vol. 33, p. 298-300, May 1950.
A study of the official method for determination of free acid in honey is reported. Maintaining the color of the phenolphthalein for 30 and 90 seconds respectively, gave too high values.

441 Weil, J. K., Stirton, A. J., and Stawitzke, Anna A.
Alkyl α-Acyloxyacetates and Propionates from Soaps and α-Halogeno Esters. Journal of the American Oil Chemists Society, vol. 27, p. 187-189, May 1950.
Twenty-six methyl, ethyl and n-butyl α-acyloxyacetates and propionates were prepared, in which the acyl group was derived from undecylenic, lauric, myristic, palmitic, oleic, stearic and phenylstearic acids. The yield, distillation range, freezing point, refractive index, density, viscosity and viscosity index were recorded. Synthesis by the reaction of a soap with an alkyl α-halogeno ester gave higher yields and greater purity than acylation by acid chlorides. Conditions for the reaction were complete dryness of the reactants, absence of free acid in the alkyl α-halogeno ester, and reaction temperatures of 150-170°. Since most of the alkyl α-acyloxyacetates and propionates appeared to be compatible with ethyl cellulose and polyvinyl chloride, they will be evaluated as plasticizers.

442 White, Johathan W., Jr.
Composition of a Volatile Fraction of Apples. Food Research, vol. 15, no. 1, p. 68-78, January-February 1950.
The chemical composition of apple essence was investigated. The principal components, together with the relative amounts of each class, are: alcohols (92 percent)--methanol, ethanol, n-propanol, isopropanol, n-butanol, isobutanol, d-2-methylbutanol, and n-hexanol; aldehydes (6 percent)--acetaldehyde, n-caproaldehyde, and 2-hexenal; and esters (2 percent)--ethyl butyrate and ethyl caproate. Methanol, ethanol, isopropanol, n-butanol and formic, acetic, propionic, butyric and n-caproic acids were identified as components of other esters. The components are present in the original apple juice in a total concentration of approximately 50 parts per million.

443 White, Jonathan W., Jr., and Walton, George P
Flavor Modification of Low-Grade Honey. AIC-272, May 1950. (Processed.)
Detailed procedures are given for production of two types of modified honeys. A product of milder but characteristic flavor results from treatment with bentonite; a completely deflavored honey sirup is produced by a refining treatment with lime and activated carbon. Chemical and physical characteristics, a cost estimate, and suggested uses for these materials are included.

444 Willits, C. O., and Ogg, C. L.
Organic Microchemistry. Analytical Chemistry, vol. 22, p. 268-271, February 1950.
A review of methods and apparatus applicable to organic microchemistry that were published during the past year.

445 Willits, C. O., and Ogg, C. L.
Report on Standardization of Microchemical Methods. Micro Kjeldahl Nitrogen Determinations. Journal of the Association of Official Agricultural Chemists, vol. 33, p. 179-188, May 1950.
A statistical summary of the data obtained by collaborators studying the applicability of a new Kjeldahl procedure for analysis of easily digested as well as refractory nitrogenous compounds. Includes details of the recommended procedure for materials not containing N-N, NO, or NO_2 linkages.

446 Willits, C. O., and Porter, W. L.
Maple Sirup. II. A New High-Flavored Maple Sirup. AIC-269, April 1950. (Processed.)
A process is described for making maple sirup having a maple flavor at least fourfold that of sirup made by conventional methods. This product can be combined with sugar sirup to make a blend of high quality and true maple flavor.

447 Willits, C. O., and Porter, W. L.
Maple Sirup. I. Research Program on Maple Products at the Eastern Regional Research Laboratory. AIC-268, April 1950. (Processed.)
A brief review of the historical and economic background of the maple products industry is given. Some of its technological problems are discussed. The paper contains an outline of the current research program at the Eastern Regional Research Laboratory, which has as its objectives better quality of maple products, improved processing methods, and new and extended uses.

448 Willits, C. O., Swain, Margaret L., Connelly, J. A., and Brice, B. A.
Spectrophotometric Determination of Nicotine. Analytical Chemistry, vol. 22, p. 430-433, March 1950.
A rapid accurate method is presented for determination of nicotine by ultraviolet spectrophotometry. The value of the method is illustrated by comparing analyses of a wide variety of tobacco and nicotine samples by this method and by the gravimetric silicotungstic acid method.

449 Witnauer, Lee P., and Senti, Frederic R.
Unit Cell and Optical Properties of t,t Δ 9,11-Linoleic Acid. Journal of the American Chemical Society, vol. 72, p. 2803-2804, June 1950.
Crystals of t,t Δ 9,11-linoleic acid from xylene solution are monoclinic plates. Optically they are biaxial positive, n_β = 1.527, and $2V$ = 34° 46′. Unit cell dimensions derived from X-ray diffraction data are a_0 = 95.69 kX, b_0 = 4.95 kX, c_0 = 7.31 kX, and β = 90.6°. The space group is probably *Cc*, and there are eight molecules per cell. The molecules are dimers inclined about 72° to the plane of the carboxyl groups.

450 Woodward, C. F.
The Overall Report on Lactic Acid. Chemurgic Digest, vol. 9, p. 9, June 1950.
This report discusses the present status and anticipated future trends of the lactic acid industry. Also discussed are current methods of production and purification, production volume and costs, uses and research achievements.

451 Wrigley, A. N., Siciliano, James, Mast, W. C., and Fisher, C. H.
Preparation and Properties of Styrenated Allyl Starch. AIC-266, March 1950. (Processed.)
Allyl starch was copolymerized with styrene in toluene solution, with cumene hydroperoxide as initiator and dipentene as polymerization regulator. Styrenated allyl starch so prepared has promise as a baking lacquer. As compared with unmodified allyl starch, it has substantially increased resistance to aqueous alcohol, soapy water, and distilled water at room temperature and at 100° C.

452 Wrigley, A. N., and Zief, Morris (Sugar Research Foundation, Inc.)
Styrenation of Allylsucrose Improves its Properties as a Coating Material. Official Digest, Federation of Paint and Varnish Production Clubs, no. 303, Part I, p. 302-308, April 1950.
Allylsucrose can be styrenated by a simple mass method to give homogeneous products which form clear films having improved water and alkali resistance. High conversion of styrene can be attained in a relatively short time by employing (a) blown allylsucrose of peroxide number 50-60; (b) 50 percent styrenes (70 percent styrene: 30 percent α-methylstyrene); (c) 0.5 to 0.65 percent peroxide catalyst (t-butyl or cumene hydroperoxides rather than benzoyl peroxide); and (d) a reaction temperature of 125° C. Films air-dried or baked at 150° C. have improved resistance to boiling water, but films cured for 1 hour at 100° C. have superior overall solvent resistance.

453 Zief, Morris (Sugar Research Foundation, Inc.)
Unsaturated Esters of Sucrose. Journal of the American Chemical Society, vol. 72, p. 1137-1140, March 1950.
Six unsaturated esters of sucrose were prepared, namely, the methacrylyl crotonyl, furoyl, cinnamoyl, undecylenoyl and allyl carbonate derivatives, and some of their properties were determined.

Polymerization of these esters at 100° C. in the presence of 1 percent benzoyl peroxide was studied. Methacrylylsucrose is the most reactive, undecylenoylsucrose is slightly reactive, the crotonyl and allyl carbonate derivatives show intermediate reactivity, and furoyl and cinnamoylsucrose do not polymerize at all. Copolymerization of these esters with styrene and methyl methacrylate in the presence of 1 percent benzoyl peroxide was also studied.

454 Zief, Morris (Sugar Research Foundation, Inc.), and Yanovsky, E. (ERRL)
Properties of Allylsucrose and Allylsucrose Coatings. AIC-265, March 1950, (Processed.)
Allylsucrose, a potentially inexpensive material, was prepared in good yield from sucrose and allyl chloride in the presence of sodium hydroxide. Various practical applications suggested by properties of the polymerized product are indicated. At present, commercial development of allylsucrose appears to be the most direct approach to the problem of industrial utilization of sucrose.

455 Zittle, Charles A., and DellaMonica, Edward S.
Effects of Borate and Other Ions on the Alkaline Phosphatase of Bovine Milk and Intestinal Mucosa. Archives of Biochemistry, vol. 26, p. 112-122, March 1950.
Alkaline phosphatases from bovine milk and intestinal mucosa are inhibited competitively by borate, probably by an ionic effect. Milk phosphatase is inhibited noncompetitively by ethanolamine. Enzyme-substrate dissociation constants (K_s) and enzyme-inhibitor constants (K_i) were calculated. Differences in pH optima, the relative inhibition by borate and ethanolamine, and K_s values indicate that the phosphatase activity of milk and that of mucosa represent two different enzymes. It is suggested that the relative inhibition by anions and cations might distinguish intestinal phosphatase from milk, kidney, and bone phosphatases.

456 Zittle, Charles A., and DellaMonica, Edward S.
Effects of Glutamic Acid, Lysine and Certain Inorganic Ions on Bovine Alkaline Phosphatases. Archives of Biochemistry, vol. 26, p. 135-143, March 1950.
Glutamic acid was more inhibitory to alkaline phosphatase of bovine intestinal mucosa than to milk phosphatase; the reverse was true of lysine. Glutamic acid inhibition was predominantly noncompetitive; the inhibition pattern resembled that of glycine rather than the competitive inhibition shown by inorganic anions. Lysine activated milk phosphatase at low substrate concentrations. Carbonate ion was more inhibitory to mucosa phosphatase than to milk phosphatase; the reverse was true of the ammonium ion. The overall inhibition pattern suggests that there are two types of alkaline phosphatases. One is the intestinal enzyme; the other is the milk enzyme, which is similar to the bone and kidney phosphatases.

1950

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Patents

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THE UNITED STATES PATENT OFFICE, WASHINGTON 25, D. C.

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Nicotinic Acid Anhydride. U. S. Patent No. 2,498,634, issued February 28, 1950.

Badgett, Charles O., and Woodward, Charles F.
N-Cyclohexyl Nicotinamide. U. S. Patent No. 2,510,945, issued June 13, 1950.

Couch, James F., Krewson, Charles F., and Porter, William L.
Process for Refining Rutin. U. S. Patent No. 2,500,930, issued March 21, 1950.

Dietz, Thomas J., and Hansen, John E.
Method of Drying Allyl Starch. U. S. Patent No. 2,510,089, issued June 6, 1950.

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Self-Advancing Winding Reel. U. S. Patent No. 2,512,645, issued June 27, 1950.

John, Harry J.
Fractionating Column. U. S. Patent No. 2,508,394, issued May 23, 1950.

Mast, William C.
Preparation of Aqueous Dispersions by Polymerization in the Presence of Ammonium Alginate. U. S. Patent No. 2,498,694, issued February 28, 1950.

Mast, William C., and Fisher, Charles H.
Synthetic Rubberlike Materials. U. S. Patent No. 2,509,513, issued May 30, 1950.

Peterson, Robert F.
Production of Casein Yarn. U. S. Patent No. 2,512,674, issued June 27, 1950.

Ratchford, William P., and Fisher, Charles H.
Pyrolysis of C-Acetoxy Aliphatic Amides to Acrylamides. U. S. Patent No. 2,494,583, issued January 17, 1950.

Rehberg, Chessie E., and Fisher, Charles H.
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